



PATENT APPLICATION
Q49782

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of

Hideyuki HAYASHI et al

Application No: 09/045,799

Group Art Unit: 2834

Filed: March 23, 1998

Examiner: TAMAI K.

For: INSERT CONDUCTOR FOR USE IN A GENERATOR AND HAVING STRUCTURE
FOR PREVENTING DEFORMATION

APPELLANTS' BRIEF ON APPEAL UNDER 37 C.F.R. § 1.192

Assistant Commissioner of Patents
Washington, D.C. 20231

Sir:

In response to the Notification of Non-Compliance with 37 CFR 1.192(c) (Paper No. 10) mailed July 13, 1999 regarding the original Appeal Brief filed June 2, 1999, Appellants submit the following substitute Appeal Brief in triplicate wherein the cancellation of claims 15-20 has been removed in favor of a concurrently filed Amendment under 37 CFR 1.116.

I. REAL PARTY IN INTEREST

The real party in interest is MITSUBISHI DENKI KABUSHIKI KAISHA by virtue of an assignment executed by Hideyuki HAYASHI and Katsuhiro SASAKI (Appellants, hereafter), on March 5, 1998, and recorded by the Assignment Branch of the U.S. Patent and Trademark Office on March 23, 1998 (at Reel 9053, Frame 0236).

II. RELATED APPEALS AND INTERFERENCES

To the knowledge and belief of Appellants, the Assignee, and the undersigned, there are no other appeals or interferences before the Board of Appeals and Interferences that will directly affect or be affected by the Board's decision in the instant Appeal.

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III. STATUS OF CLAIMS

The application was originally filed with claims 1-8. Claims 7 and 8 have been cancelled and claims 9-20 have been added by an Amendment filed on October 28, 1998. Claims 1-6 and 9-20 are all of the claims currently pending in the application. Claims 1-6 and 9-14 are the subject of this appeal. Claims 15-20 are being cancelled in a concurrently filed Amendment under 37 CFR 1.116.

Claims 1-4 currently stand finally rejected under 35 U.S.C. § 103 as being unpatentable over Byrne et al. (USP 3,544,857) in view of Nakazawa et al. (USP 5,648,682). Claim 5 stands finally rejected under 35 U.S.C. § 103 as being unpatentable over Byrne et al. and Nakazawa et al., in further view of Huber (USP 4,845,396). Claim 6 currently stands rejected under 35 U.S.C. § 103 as being unpatentable over Byrne et al. and Nakazawa et al., in further view of Yoshida (Japanese Kokai no. 4-34995). Claims 9-13 currently stand rejected under 35 U.S.C. § 103 as being unpatentable over the Appellants' admitted prior art and Murata (USP 5,137,677). Claim 14 currently stands rejected under 35 U.S.C. § 103 as being unpatentable over the Appellants' admitted prior art and Murata, in further view of Barber et al. (USP 5,208,499). Claims 15-19 stand finally rejected under 35 U.S.C. § 102 as being anticipated by the Appellants' admitted prior art. Claim 20 stands finally rejected under 35 U.S.C. § 103 as being unpatentable over the Appellants' admitted prior art, in further view of Barber. No other grounds of rejection are currently pending.

IV. STATUS OF AMENDMENTS

With the filing of this Brief, all previously filed Amendments have been entered and considered by the Examiner. Note, however, that an Amendment canceling claims 15-20 is being filed concurrently herewith.

V. SUMMARY OF THE INVENTION

Appellants' invention is directed to an insert conductor used as part of a brush holder which, in turn, can be incorporated in a vehicular charging generator. An insert conductor according to the prior art had various problems. One such problem was that portions of the wiring

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sections of the insert conductor were exposed to the outside elements when the charging generator was complete. As a result, the wiring sections were oftentimes damaged by corrosion. The present invention addresses this problem by ensuring that all critical portions of the insert conductor, which might be damaged if exposed to the elements, are sealed in an enclosed resin structure.

Another problem in the prior art addressed by the present invention is the unnecessarily complicated manufacturing process whereby the insert conductor is made. In the prior art, in order to address the problem of the exposed portions of the wiring sections, additional structures and corresponding manufacturing time to make and install the additional structures were required. According to the present invention, however, the additional structures mentioned are not required and, accordingly, manufacturing time is reduced.

Furthermore, the present invention claims a deformation preventer which protects the wires, contained in the wiring section, during the stage of manufacturing wherein the insert resin is formed. The claimed invention ensures that critical wiring contacts are not exposed to moisture and other outside conditions which may cause corrosion or similar damage and, at the same time, ensures that the wiring sections are protected from being structurally deformed during the manufacturing process of encapsulating the insert conductor in resin.

VI. ISSUES

Issue 1 - Whether claims 1-4 are patentable under 35 U.S.C. § 103 over Byrne et al. in view of Nakazawa et al.

Issue 2 - Whether claim 5 is patentable under 35 U.S.C. § 103 over Byrne et al. and Nakazawa et al., in further view of Huber.

Issue 3 - Whether claim 6 is patentable under 35 U.S.C. § 103 over Byrne et al. and Nakazawa et al., in further view of Yoshida.

Issue 4 - Whether claims 9-13 are patentable under 35 U.S.C. § 103 over the Appellants' admitted prior art and Murata.

Issue 5 - Whether claim 14 is patentable under 35 U.S.C. § 103 over the Appellants' admitted prior art and Murata, in further view of Barber et al.

VII. GROUPING OF CLAIMS

For each ground of rejection which appellants contest herein which applies to more than one claim, such additional claims, to the extent separately identified and argued below, do not stand or fall together.

VIII. ARGUMENT

Issue 1 - Whether claims 1-4 are patentable under 35 U.S.C. § 103 over Byrne et al. in view of Nakazawa et al.

Independent claim 1, from which each of claims 2-4 depend, requires as follows:

1. An insert conductor comprising:
a conductor having a wiring section which includes a plurality of wires, an outer frame surrounding the wiring section, and connections which connect said outer frame and said wiring section and which interconnect said wires; and
a deformation preventer which is provided on said conductor such that the deformation preventer extends over said wires and which prevents the conductor from being deformed by a resin injection pressure applied during insert resin molding.

The deformation preventer, as claimed, is used to protect the wires of the conductor from being deformed during a subsequent process wherein the wires are encapsulated in resin. It is clear from the present application, i.e. page 9, lines 11-16 and page 9, line 24 through page 10, line 3, that the deformation preventer 62 is provided to reinforce the mechanical strength of the conductors 61 during a resin injection process wherein high pressure forces are applied to the assembly. Moreover, the claim requires a deformation preventer that "*prevents the conductor from being deformed by a resin injection pressure applied during insert resin molding.*" By providing the deformation preventer it is possible to encapsulate the wires completely without requiring a subsequent step that exposes portions of the wires to corrosion.

The invention in Byrne relates to an integrated circuit assembly with a lead structure which includes thin film elements for connecting leads to contact pads. The thin film elements are made on an insulating material such as plastic film. At col. 4, lines 9-13, Byrne discloses that plastic is desirable because "it is relatively stable dimensionwise under changes in temperature

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and is capable of withstanding relatively high temperatures from 250° to 500° C. to permit the use of various attaching techniques ...”

The Examiner contends, on page 3 of the final Office Action, that “Byrne teaches a conductor having a plurality of wires (17), an outer frame (18) and connections (17b), and a plastic plate (13) which supports the plurality of wires in the encapsulated body. The plastic plate 13 inherently helps prevent deformation of the wires during encapsulation in an insulating body.” Further, on page 6, paragraph 13 of the final Office Action, the Examiner states that “[t]he insulating sheet 13 connects the leads 17 so that the leads are structurally united to each other and are less likely to be deformed during encapsulation.”

Appellants respectfully disagrees with the Examiner’s assessment of Byrd’s insulating sheet 13. Further, Appellants contends that there exists no basis within Byrd to support the Examiner’s conclusion that the insulating sheet 13 is the same as the claimed deformation preventer. The Examiner is obviously of the opinion that insulating sheet 13 serves a structural purpose within the manufacturing process of an integrated circuit assembly whereby the leads 17 which electrically connect the integrated circuit with a circuit assembly board are prevented from being deformed in a subsequent encapsulating process. This assessment, however, is completely contrary to the teachings of Byrd. The insulating member 13 of Byrd is provided for the purpose of thermally insulating the integrated circuit assembly during manufacturing. See col. 4, lines 4-13. As shown clearly in Figs. 1-3 and 6, conducting leads 22 are formed on insulating sheet 21 to form insulating member 13. As shown in Fig. 3, the conducting leads 22 approach each other more closely at the center of insulating member 13 than do the leads 17 of lead frame 12. This is because leads 22 are formed to contact directly with die 11 while leads 17 are not. Leads 22 are further formed such that they do not reach the ends of insulating sheet 21. This is because it is intended that leads 22 provide contact with die 11 while leads 17 provide contact with a circuit card or circuit board. After leads 22 are connected to die 11, via pillars 16, lead frame 12 is placed over the insulating member 21 such that leads 17 and leads 22 contact each other, as shown in Fig. 6. The assembly is then heated so leads 17 and leads 22 become bonded together with solder bonds to form a rigid assembly. See col. 4, lines 55-65. The leads 17 are then cut.

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from the lead frame structure 18 and the insulating member 21 with the die 11 attached is encapsulated in plastic, as shown in Fig. 8.

Nowhere in Byrd is it disclosed that insulating sheet 13 provides any sort of structural support during the encapsulation process where pressure might be applied. In fact, Byrd discloses that quite the opposite result is more likely. At col. 5, lines 26-34, Byrd teaches that while other suitable thermal insulators such as glass or ceramic might be used, it is more desirable to use plastic because 1) plastic "is not readily damaged by thermal shock such as glass," and 2) "plastic is *flexible* so that the die can be mounted under it and the leads can be flexed downwardly directly into contact with the printed circuit board." (emphasis added). Therefore, insulator sheet 13 does not "inherently help prevent deformation of the wires during encapsulation" as the Examiner contends. The idea that a flexible plastic sheet placed partially under the ends of leads 22 or 17 simply is not consistent with the teachings of Byrd. Even if a rigid material such as glass or ceramic were used, the insulating sheet would not provide any additional structural support to the leads during a resin injection process where pressure is applied to the leads. The insulating sheet 13 is attached to leads 22 (Fig. 3) and then leads 17 are attached to leads 22 (Fig. 6). The ends of leads 17 are cut from lead frame 12 (Fig. 8) and then the insulating sheet 13, leads 22 and a portion of leads 17 are encapsulated (Fig. 8). If pressure were applied during the encapsulating process, insulating sheet 13 would not provide "deformation" protection to either leads 17 or leads 22. In fact, a rigid insulating material would likely contribute to deformation since it is attached to leads 22. As pressure is applied to the insulating sheet, the sheet would move and hence, bend the leads.

Even if Byrd is found to teach the claimed deformation preventer, however, the asserted combination of Byrd with Nakazawa, for which the Examiner relies on as teaching the claimed "insert resin molding," is not a permissible combination for §103 purposes. Appellants respectfully asserts that one of skill in the art of vehicle charging generators and specifically, the brush holders employed therein, would not be motivated to consult references wherein the processes of integrated circuit packaging are disclosed. Both Byrd and Nakazawa are directed to semiconductor devices and the processes employed in packaging the devices. The claimed invention, alternatively, while directed to an electrical device generally, does not consider, nor

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need to consider, the specific problems encountered in semiconductor device packaging, such as the temperature considerations dealt with in choosing the insulating material in Byrd.

Because Byrd does not teach the claimed deformation preventer of independent claim 1 and because the combination of Byrd with Nakazawa is impermissible under §103, Appellants respectfully asserts that claim 1 is allowable for at least these reasons. Moreover, because claims 2-4 depend directly from claim 1, Appellants further asserts that claims 2-4 are also allowable for at least the same reasons.

Issue 2 - Whether claim 5 is patentable under 35 U.S.C. § 103 over Byrne et al. in view of Nakazawa et al., in further view of Huber.

For at least the same reasons as set forth above in Issue 1 with respect to claim 1, Appellants respectfully submits that claim 5, which is dependent upon claim 1 through claim 3, is also allowable. Additionally, Appellants submits that the combination of Byrne, Nakazawa and Huber is impermissible for § 103 purposes. As already discussed, Byrne and Nakazawa are directed to semiconductor device packaging techniques and processes. Huber, on the other hand, relates to a brush holder assembly for an electric motor. Contrary to the Examiner's assertions, it would not have been obvious for one skilled in the art of vehicle charging generators would not be motivated to combine the teachings of two references (Byrd and Nakazawa) dealing with semiconductor packaging techniques and the unique considerations required therein, with the teachings of Huber. There is simply no disclosure within any of the three references which would motivate the skilled artisan to combine the individual teachings of each reference in a piecemeal fashion in order to end up with the claimed invention. The Examiner has clearly used "hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention."¹ This is clearly an inappropriate manner in which to support a conclusion of obviousness.

¹ *In re Fritch*, 972 F.2d 1260, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992) (quoting *In re Fine*, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988).

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Thus, the Examiner has not only failed to present prior art that teaches each of the claimed elements, as discussed above, but he has also relied upon references that come from such different technology areas that one of skill in the art at the time the invention was made would not have been motivated to consult the teachings of each reference and, more importantly, would not be motivated to combine the respective teachings of each reference asserted.

Issue 3 - Whether claim 6 is patentable under 35 U.S.C. § 103 over Byrne et al. and Nakazawa et al., in further view of Yoshida.

For at least the same reasons as set forth above in Issue 1 with respect to claim 1, Appellants respectfully submits that claim 6, which is dependent upon claim 1 through claim 3, is also allowable. Additionally, Appellants submits that the combination of Byrne, Nakazawa and Yoshida is impermissible for § 103 purposes. The Examiner contends, at page 4 of the final rejection, that "it would have been obvious to a person skilled in the art at the time of the invention to construct the insert conductor of Byrne with the deform preventer made of polyphenylene sulfide resin because Yoshida teaches that polyphenylene sulfide resin provides good adhesion and a firm adhesive property." However, there is no disclosure in any of the other cited references that indicates that these particular properties are desirable and thus, one of skill in the art would not be motivated to combine this particular feature with the respective teachings of the other references.

Also, for similar reasons as those set forth above with respect to issue 2, Appellants submits that one of skill in the art of vehicle charging generators would not have been motivated to consult the teachings of references dealing with semiconductor packaging. Further, there is no disclosure within any of the cited references with respect to issue 3 that would motivate one of skill in the art of vehicle charging generators to combine the respective teachings of two semiconductor device packaging references with a reference that deals with the manufacture of wiring boards. The Examiner has, again, used "hindsight reconstruction" in an attempt to piece together the claimed invention.

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Issue 4 - Whether claims 9-13 are patentable under 35 U.S.C. § 103 over the Appellants' admitted prior art and Murata.

Independent claim 9, from which each of claims 10-13 depend, requires as follows:

9. A vehicle generator comprising:
a fan (5) which generates airflow;
a regulator (18);
a stator coil (16);
a brush holder (67); and
a ventilation guide (19) which is fixed to a peripheral portion of said brush holder, wherein the ventilation guide guides airflow, generated by said fan, to said regulator and said stator coil;
said brush holder comprising:
a conductor which has a wiring section composed of a plurality of wires, and outer frame surrounding the wiring section, and connections which connect said outer frame and said wiring section and which interconnect said wires; and
an insulating member which prevents the conductor from being deformed by a resin injection pressure applied during insert resin molding.

The Examiner contends, at page 5, paragraph 10, of the final rejection, that "Murata teaches an insert conductor for a magnetic device which has a resin premold to help support the conductors molded in an injection molded resin to provide a skeletal framework for the components which are to be injection molded." The Examiner contends that the projection 1a of mold 1 in Figs. 2 and 3 is an insulating member which prevents conductors 3a and 3b from being deformed by resin injection pressures. Whether or not the Examiner is correct is irrelevant, however, in view of the fact that this method actually teaches away from the claimed method. The mold of Murata is explicitly taught to be separated from the Hall sensor device once the resin molding is complete. See col. 2, lines 47-49. This means that, even if a skilled artisan were motivated to consult the teachings of Murata, any combination of the mold, consisting of projection 1a, with the prior art disclosed in the application, would not result in the claimed invention. Murata teaches using a portion of the mold itself to prevent deformation during the molding process, not an insulating member which is part of the finished product, e.g. the claimed brush holder.

Thus, because neither the Appellants' disclosed prior art nor Murata teach or suggest the claimed insulating member of independent claim 9, Appellants respectfully submits that claim 9

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is allowable. Further, because claims 10-13 depend from claim 9, Appellants submits that claims 10-13 are similarly allowable.

Issue 5 - Whether claim 14 is patentable under 35 U.S.C. § 103 over the Appellants' admitted prior art and Murata, in further view of Barber et al.

For at least the same reasons as set forth above with respect to issue 4, Appellants respectfully submits that independent claim 14 is also allowable.

The Examiner has fundamentally relied on the same arguments for rejecting claim 14 as he did for rejecting claim 9-13. The only addition is that the insulating member claimed in claim 14 is made from polyphenylene sulfide resin. For rejecting this added limitation, the Examiner additionally relies on Barber. Whether or not Barber teaches the added feature is irrelevant in view of the fact that, as discussed above with respect to claims 9-13, Murata fails to teach or suggest the claimed insulating member.

IX. CONCLUSION

Appellant respectfully requests the members of the Board to reverse the rejection of all appealed claims and to find each of the claims allowable as defining subject matter which is not unpatentable under 35 U.S.C. § 103(a) over Crook in view of Appellant's admitted prior art.

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This Brief is being submitted in triplicate, and a check for the Brief fee is attached hereto. Appellants hereby petition for any extension of time which may be required to maintain the pendency of this case, and any required fee, except for the Issue Fee, is to be charged to Deposit Account No. 19-4880.

Respectfully submitted,

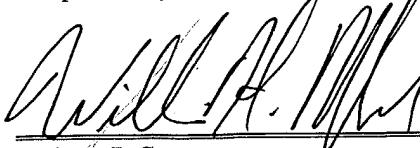
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APPENDIX

Claims involved in the Appeal:

1. An insert conductor comprising:
a conductor having a wiring section which includes a plurality of wires, an outer frame surrounding the wiring section, and connections which connect said outer frame and said wiring section and which interconnect said wires; and
a deformation preventer which is provided on said conductor such that the deformation preventer extends over said wires and which prevents the conductor from being deformed by a resin injection pressure applied during insert resin molding.
2. The insert conductor according to claim 1, wherein said conductor is formed by stamping a single metal sheet.
3. The insert conductor according to claim 1, wherein said deformation preventer is provided with an engaging portion that engages a portion to be engaged which is formed in a discrete wire.
4. The insert conductor according to claim 3, wherein said discrete wire is included in said conductor.
5. The insert conductor according to claim 3, wherein said discrete wire is the connector terminal of a brush holder.
6. The insert conductor according to claim 1, wherein said deformation preventer is composed of polyphenylene sulfide resin.
9. A vehicle generator comprising:
a fan 95) which generates airflow;

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a regulator (18);
a stator coil (16);
an brush holder (67); and
a ventilation guide (19) which is fixed to a peripheral portion of said brush holder,
wherein the ventilation guide guides airflow, generated by said fan, to said regulator and said
stator coil;

said brush hold comprising:

a conductor which has a wiring section composed of a plurality of wires, an outer from
surrounding the wiring section, and connections which connect said outer frame and said wiring
section and which interconnect said wires; and

an insulating member which prevents the conductor from being deformed by a resin
injection pressure applied during insert resin molding.

10. The vehicle generator according to claim 9, wherein said conductor is formed by
stamping a single metal sheet.

11. The vehicle generator according to claim 9, wherein said insulating member is
provided with an engaging portion that engages a portion to be engaged which is formed in a
discrete wire.

12. The vehicle generator according to claim 11, wherein said discrete wire in
included is said brush holder.

13. The vehicle generator according to claim 11, wherein said discrete wire is a
connector terminal of said brush holder.

14. The vehicle generator according to claim 9, wherein said insulating member is
composed of polyphenylene sulfide resin.